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# Anadromous Fish Reintroduction in the Upper Columbia River Basin An Overview

Stephen Smith  
*UCUT*

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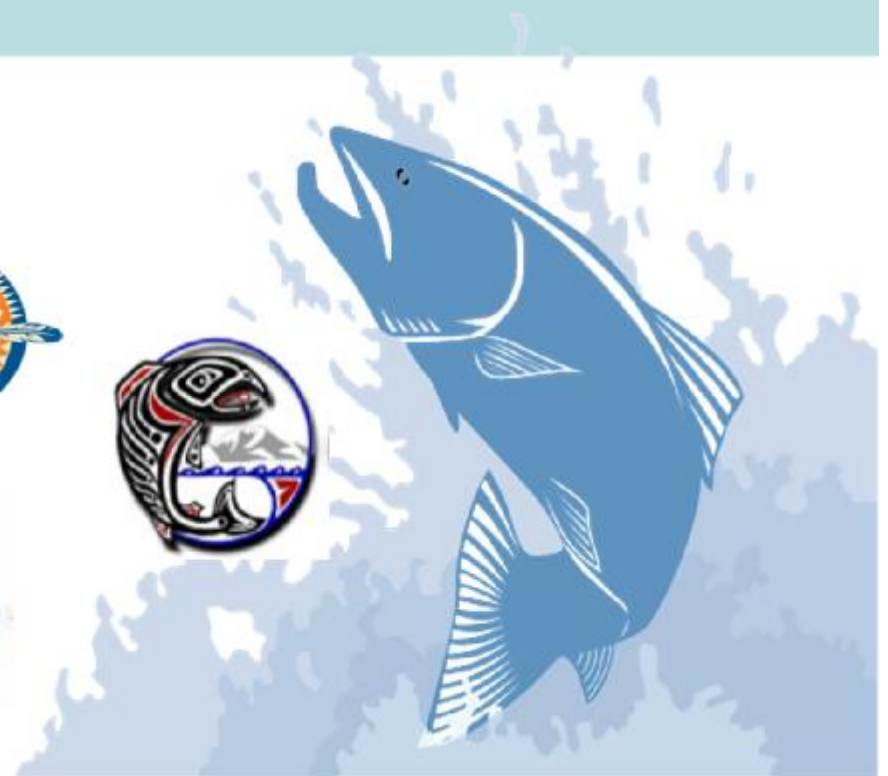
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# Anadromous Fish Reintroduction in the Upper Columbia River Basin An Overview

June 20, 2017

Stephen Smith, UCUT



# Presentation Outline

- Effects of Upper Columbia River Blockages
- Joint Fish Passage Paper
- 3 Forums for Salmon Reintroduction
- Phase 1 Work

# Columbia Basin



# Canadian Dams of Interest





An aerial photograph of the Grand Coulee Dam, a massive concrete structure spanning a wide river. The dam features a large spillway with multiple bays where water is cascading down. To the left of the main dam structure is a smaller, curved spillway. The reservoir behind the dam is a deep blue, filling a valley. The surrounding landscape is arid with sparse vegetation and rocky hills. In the foreground, below the dam, there is a gravel bar and some infrastructure including roads and a small building.

# Grand Coulee Dam

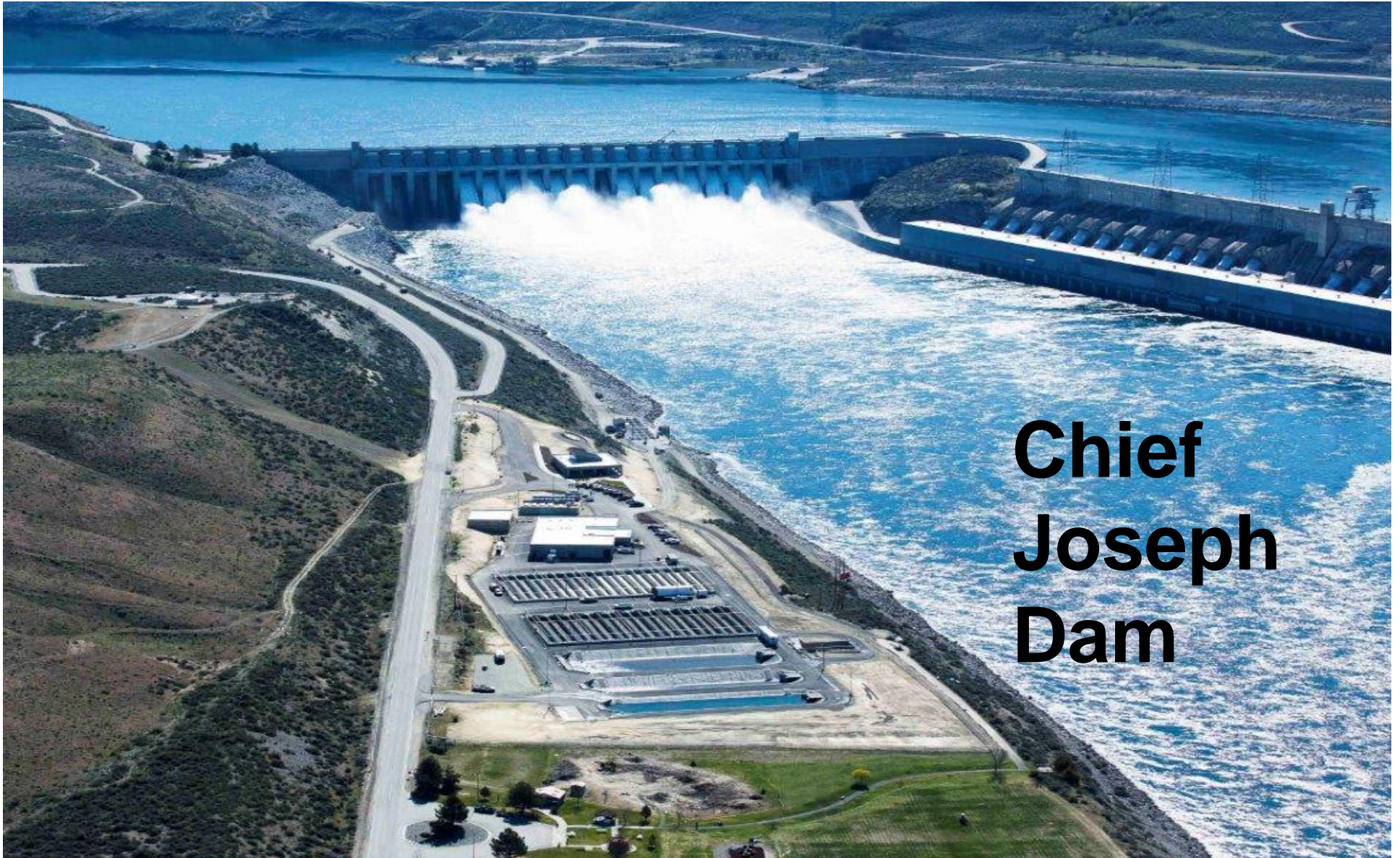
**Built in 1942**

**550' (168 m) high**

**151 mile (243 km) reservoir**

**6,809 Mw capacity**





# **Chief Joseph Dam**

**Built in 1955**

**236' (72 m) high**

**51 mile (82 km) reservoir**

**2.260 Mw capacity**



# Canadian Dams



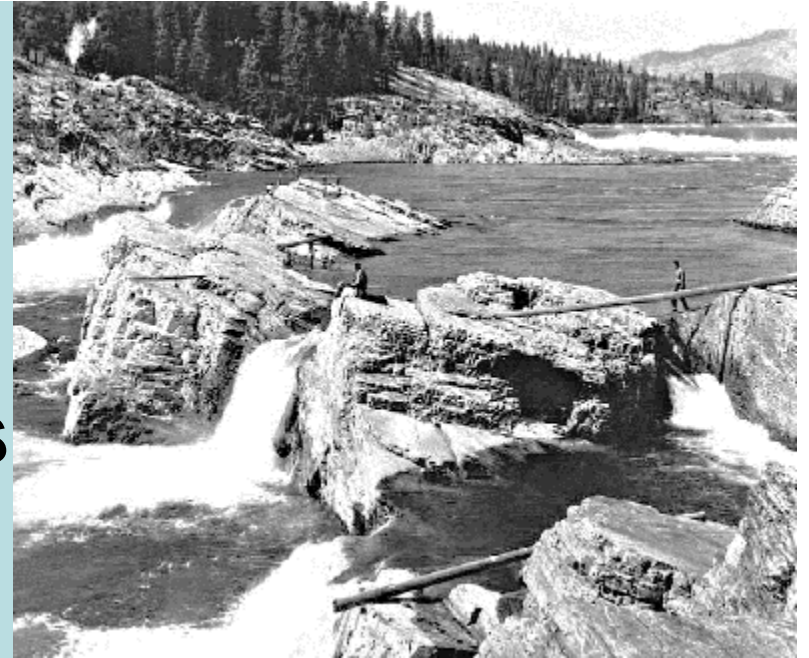




- **Annual average runs above Grand Coulee of 2.6 – 3.7 million salmon and steelhead**
- **Thousands of stream miles of mainstem and tributary habitat**
- **4 major nursery lakes**



- **5 Upper Columbia tribes annual consumption of 6.8 to 13.1 million pounds (~650,000 fish)**



- **First Nations' annual consumption of 125,000 – 750,000 salmon and steelhead**



- **Lower river tribes' annual harvest of 1.5 to 2.6 million salmon and steelhead from above Chief Joseph Dam.**



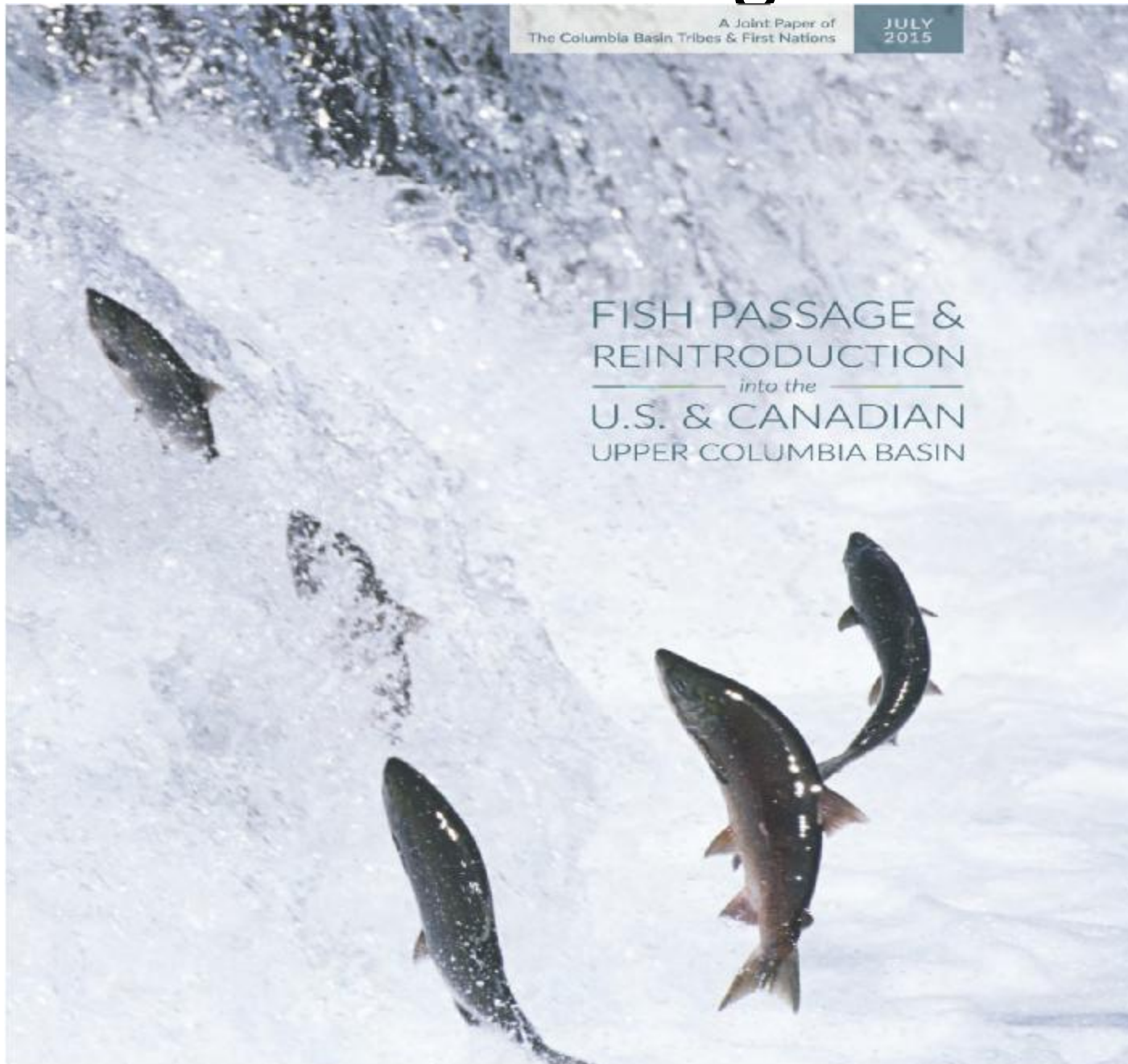
# Why Reintroduction Now?

- Unmitigated injustice to tribes and other upper basin communities and economies
- Technology has improved for adult and juvenile salmon passage at high head dams
- New passage technologies have little, if any impact, on current project beneficiaries: power generation, flood control, and irrigation

# Why Reintroduction Now?

- Reintroduction may be, and likely is, viable and needs to be investigated
- Nearby Sockeye & Chinook runs very productive
- Federal government is requiring fish passage at most private dam blockages
- Climate Change – get the salmon back to cooler habitats

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# Columbia River Treaty

- **December 2013:**
  - “The United States should pursue a joint program with Canada, with shared costs, to investigate and, if warranted, implement restored fish passage and reintroduction of anadromous fish on the mainstem Columbia River to Canadian spawning grounds.”

# Northwest Power and Conservation Council



Columbia  
River Basin  
Fish and Wildlife  
Program 2014



## Phased Approach to Reintroduction

***“Investigate habitat availability, suitability and salmon survival potential in habitats above Grand Coulee.”***

# Columbia River F&W Program

- “Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the United States”
- 3 Phases
  - Phase 1: Information Review (12/16)
  - Phase 2: Pilot Reintroductions and Interim Passage Facilities
  - Phase 3: Permanent Reintroduction and Facilities



# Tribal Action

- Tribes reserve the right to reintroduce salmon
- Pilot reintroductions are a near term possibility

# Phase 1 Implementation

- U.S. Habitat Assessment
  - Donor Stock Assessment
  - Risk Assessment
  - Life-Cycle Model
- 
- Review of High Head Dam Fish Passage Facilities

# Major Reintroduction Risks

- Evolutionary (genetics)
- Demographic (numbers)
- Ecological (predation and competition)
- Disease

*As identified in Anderson et al. 2014 (NAJFM; v34)*



# Life Cycle Modeling

Evaluate reintroduction options and strategies



Identify key uncertainties, research and facility needs



Provide data needed to move the programs forward

# Phase 1 Report

- Habitat Assessment
- Donor Stock Assessment
- Risk Assessment
- Reintroduction Strategies
- High Head Dam Fish Passage Facility Options
- Life Cycle Modeling
- Alternative Fish Passage Facility Configurations
- Key Uncertainties
- Cost and Financing Considerations
- Recommendations

# Floating Surface Collector



Floating Surface Collector; Net Guidance System

# Floating Surface Collector





# Whooshh “Salmon Cannon”



# West Coast Reintroductions

- 20 other West Coast watersheds
- 48 dams

**THANK**

**YOU**